

Docket No.: 50032-150



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Response
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PATENT 12-10-01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

TC 2001-161-16M
: **RESPONSE UNDER 37 CFR 1.116**
: **EXPEDITED PROCEDURE**

Toyohiko KUMAKURA, et al.

Serial No.: 09/237,860

: Group Art Unit: 2841

Filed: January 27, 1999

: Examiner: K. Cuneo

For: WIRING BOARD, SEMICONDUCTOR DEVICE, ELECTRONIC DEVICE, AND
CIRCUIT BOARD FOR ELECTRONIC PARTS

AMENDMENT UNDER 37 CFR 1.116

Box AF
Commissioner for Patents
Washington, DC 20231

Sir:

The following amendment and remarks are submitted in response to the Office Action

dated June 5, 2001.

REMARKS

IN THE DRAWINGS

The Office Action again objected to the drawings, stating the figures are improperly cross-hatched and that "all of the parts in cross section, and only those parts, must be cross-hatched" and states that the cross hatching "should be selected from those shown on page 600-84 of the MPEP based on the material of the part." To comport with the Examiner's requirement, Figure 1 has been amended to depict insulation board 11 as "electrical insulation" in accord with the corresponding symbol provided for electrical insulation in MPEP § 608.02. Figure 1 has also been amended to depict insulating film 16 as "synthetic resin" in accord with the

corresponding symbol provided for electrical insulation in MPEP § 608.02. Electromagnetic shielding film 17 is represented as a metallic film in accord with at least one embodiment described in Applicant's specification. Signal leads 12, control lead 13, power source lead 14 and ground lead 15 are represented as metals in accord with at least one embodiment of Applicant's specification.

The amendments to Figure 1 are illustrative in nature and are not considered to limit the disclosure of the specification in any way. Figure 1 merely depicts one possible embodiment of the invention using the highly generalized graphic symbols provided in MPEP § 608.02.

The Examiner stated Figure 8, section B-B' should be section 9-9 to correspond to Figure 9. This matter is addressed in the amendments to the specification provided herein and the accompanying Drawing Change Authorization Request. The Drawing Change Authorization Request also requests approval for changes to correct spelling errors in Figs. 5, 19, and 20.

In accord with the above comments, withdrawal of the objection to the drawings is requested.

IN THE SPECIFICATION

The Specification was objected to for not having legible page numbers.

The Examiner denied entry of the Substitute Specification submitted April 12, 2001, "because it is not in compliance with MPEP § 608.01(q)." The Examiner states that "the substitute specification must be accompanied by a marked-up copy showing all the changes".

The Examiner is hereby authorized to enter page numbers on each page of the specification by Examiner amendment in accord with MPEP § 1302.04 to correct the obvious error resulting in the truncation of the page numbering. Such numbering may optionally include the numeral 1 at the top or bottom of the first page and must, starting on the second page,

increase incrementally with each successive page (e.g., 2, 3, 4, etc.) up to and including the last page of the text portion of the specification (preferably using the same numeral placement on each page). The undersigned has compared the original application printed from a facsimile transmission to the clean electronic version of the specification (previously submitted and not entered) and has verified that the pages of the original application should be numbered with page numbers increasing incrementally by increments of 1 (one).

Withdrawal of this objection is accordingly requested.

35 U.S.C. § 112, SECOND PARAGRAPH REJECTION

Claims 1 and 5-9 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

CLAIM 1

The Examiner states that the last two lines of claim 1 are indefinite “because it is unclear whether placement of the film within 150 micrometers of the wiring section and the film having the claimed resistance reduces the cross talk or whether some other element is required to perform this function.” The Examiner continues, stating “it is unclear whether this function is inherent to the already recited structure or whether it implied structural limitations not explicitly recited in the claim.”

Applicants respectfully traverse. Definiteness of claim language must be analyzed in light of the content of the application disclosure, the teachings of the prior art, and the claim interpretation that would be given by one of ordinary skill in the art at the time the invention was made. The essential inquiry is whether the claims set out and circumscribe a particular subject matter with a *reasonable degree* of clarity.

Claim 1 sets forth functional language. A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehard*, 439 F.2d 210 (CCPA 1971). A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used.

It is respectfully submitted that one skilled in the art, in view of Applicant's specification, would understand Applicant's disclosure relating to the above-noted functional language to relate the objective range extending from 10 MHz to 15 GHz in sinusoidal frequency to the claimed wiring board and the effects of such object range frequencies (i.e., current through the wiring section) on the generation of magnetic fields (H) and eddy currents (Is) (*see, e.g.*, page 9, line 27 to page 10, line 5). The eddy current Is reduces a magnetic flux density of the magnetic flux and the reduction in magnetic flux density decreases inductance (*see, e.g.*, page 10, line 17 to page 11, line 5; *see also* page 11, lines 17-28).

Claim 1 thus submitted to comport with 35 U.S.C. § 112, second paragraph, as the claim sets out and circumscribes a particular subject matter with a *reasonable degree* of clarity. Such language has been held to be proper under 35 U.S.C. § 112, second paragraph, as it sets forth definite boundaries on the patent protection sought. *In re Barr*, 444 F.2d 588 (CCPA 1971). As such, the last two lines of claim 1 are not indefinite and it is requested that this legally improper rejection be withdrawn.

Applicants also traverse the remaining aspects of the 35 U.S.C. § 112, second paragraph rejection of claim 1. The Examiner states that line 5 should recite "the distance" instead of "a

distance” and that line 6 should recite “the volume specific resistance” instead of “a volume specific resistance”. Definiteness of claim language must be analyzed in light of the content of the application disclosure, the teachings of the prior art, and the claim interpretation that would be given by one of ordinary skill in the art at the time the invention was made. The essential inquiry is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity. Applicants have set forth, in detail, a claim providing such clarity. Whether more suitable language or modes of expression are available in not the requisite test. In the present claim, the proposed change is a distinction without a difference as the change does not improve the already clear intent of the recitation. Claim 1 is submitted to comport with 35 U.S.C. § 112, second paragraph.

Withdrawal of this 35 U.S.C. § 112, second paragraph rejection of claim 1 is therefore requested in accord with the above clarification of the record and above remarks.

CLAIM 5

Regarding claim 5, the Examiner states that in the last three lines “flowing eddy current” is indefinite. The Examiner comments that “[t]he insulating layer does not perform any flowing function.”

The last three lines recite, in full, “wherein said insulating substrate disposed on said plate-like ground layer reduces a self inductance of said plurality of leads *by flowing eddy current through said plate-like ground layer.*” (emphasis added). It is facially clear that the eddy current flows through the plate-like ground layer, as recited. The Examiner is, however, correct in her assertion that “[t]he insulating layer does not perform any flowing function”.

As claim 5’s recitation of “flowing eddy current” in the last three lines sets out and circumscribes a particular subject matter with a reasonable degree of clarity, analyzed in light of

the applicant's disclosure, the teachings of the prior art, and the claim interpretation that would be given by one of ordinary skill in the art, claim 5 is submitted to fully comply with 35 U.S.C. § 112, second paragraph.

CLAIM 6

The Examiner rejects claim 6 under 35 U.S.C. § 112, second paragraph, stating that the recitation of "being formed on a ground layer" on claim 6, line 2, "is unclear".

Claim 6 recites, in accord with the April 12, 2001, Amendment:

6. The circuit board for electronic parts as claimed in claim 5, wherein said conductor forms a composite sheet together with said insulating material.

However, there is no recitation of "being formed on a ground layer" in the presently pending claim 6. The Examiner is obviously referring to an outdated, originally-filed version of claim 6. Withdrawal of this rejection is requested.

CLAIM 7

The Examiner rejects claim 7 under 35 U.S.C. § 112, second paragraph, stating that the insulating material does not "contain" or "include" the adhesive but instead "bears" the adhesive and alleging that "this description is confusing".

As noted above, definiteness of claim language must be analyzed in light of the content of the application disclosure, the teachings of the prior art, and the claim interpretation that would be given by one of ordinary skill in the art at the time the invention was made. The essential inquiry is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity. Whether more suitable language or modes of expression are available in not the requisite test.

Moreover, the Examiner's suggestion of the improved language "bears" itself serves as evidence that one skilled in the art would be able to reasonably understand the meaning of the claim language and relation between the insulating material and the adhesive, particularly in view of the specification (see, e.g., Figs. 19-20 and corresponding description).

The Applicant is entitled to be his own lexicographer as long as the meaning assigned to the term is not repugnant to the term's well known usage. See *In re Hill*, 161 F.2d 367 (CCPA 1947). The term "contains" is synonymous with the term "hold", which has many meanings including "to cover" (e.g., "she had to *hold* her ears because of the cold") and "to remain fastened to something" (e.g., "the anchor *held* in the rough sea"). Accordingly, the use of the term "contains" is not repugnant to the term's well known usage and is, moreover, clearly understood in its own right.

Claim 7 is submitted to fully comply with 35 U.S.C. § 112, second paragraph.

Therefore, for the above reasons, it is submitted that claims 1 and 5-9 are in full compliance with 35 U.S.C. § 112, second paragraph. Withdrawal of this rejection is requested.

35 U.S.C. § 112, FIRST PARAGRAPH REJECTION

Claims 5-9 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in such a way as to reasonably convey to one skilled in the art that the inventor(s) had possession of the claimed invention. This rejection is traversed.

The Examiner notes that claim 5 recites "a plate-like ground layer" and "a conductor disposed on an insulating material on said plurality of leads" and alleges that "the specification does not describe a plate-like ground layer".

Description of the claimed “plate-like ground layer” may be had by reference to page 23 of the specification, which states in part “The circuit board 1 is composed of a substrate material 3 made of an insulating material, *a plate-like ground layer 4* disposed in the substrate material 3, and a lead 5 of a predetermined pattern which is formed on the surface of the substrate material 3” (lines 19-22)(emphasis added)(see also, page 24, lines 9 and 28; Figs. 19-20).

Thus, contrary to the Examiner’s assertion, the specification clearly describes and illustrates a plate-like ground layer.

Next, the Examiner alleges that “such a configuration is not disclosed with respect to the elected invention (paper #8) of the circuit board”. The elected invention corresponds to the imposed Grouping of Claims 1-2 and 5-9 (see paper no. 8). The preamble of Claim 5 originally recited, and still recites, “A circuit board for electronic parts, comprising: . . .”. The amendments to claim 5 in the April 12, 2001, Amendment pertain to the elected “circuit board”.

Accordingly, withdrawal of this rejection is requested.

35 U.S.C. § 103(A) REJECTION OVER ANDERSON

Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over **Anderson** (U.S. Pat. No. 4,441,088). This rejection is traversed. Reconsideration and withdrawal of this rejection is requested.

Claim 1 provides a wiring board for a semiconductor device. The wiring board includes a predetermined wiring section disposed on an insulation board and an electromagnetic shielding film placed at a position close to the wiring section, wherein a distance defined between the wiring section and the electromagnetic shielding film is 150 μm or less and a volume specific resistance of the electromagnetic shielding film is 30 $\mu\Omega\cdot\text{cm}$ or less at a room temperature. This

structure provides, over an applicable frequency between about 10 MHz to 15GHz, a reduction in inductance of the wiring section and a reduction in inductive cross talk.

In particular, according to the above structure, the material property required as an electromagnetic shielding film is determined to have a volume specific resistance of $30\ \mu\Omega\cdot\text{cm}$ or less at a room temperature, which is a specific low value, and that applicable frequency extending from 10 MHz to 15 GHz, which is a specific high value. Therefore, the eddy current generated on the electromagnetic shielding film can be increased.

The eddy current, which is generated by the current flowing through a plurality of leads on a wiring board, flows in a direction in which a magnetic flux is canceled (*see* eddy currents Is depicted in Fig. 2; page 10, lines 6-16)). Therefore, inductances of the lines (self inductance as well as mutual inductance between leads) and inductive cross talk can be decreased, whereby speeding up in transmission of signal and data can be achieved (*see, e.g.*, page 11, lines 1-5; page 18, line 24 to page 12, line 4).

The Examiner alleges that **Anderson** discloses that the distance (H) between the wiring section (conductor 12) and the film (ground plane 16) is 3.3 mils ($83.8\ \mu\text{m}$), citing col. 4, line 8, and alleges **Anderson** disclose other dimensional parameters intended to reduce cross talk (citing col. 3, lines 50-54; col. 4, lines 55-70). **Anderson** is therefore alleged to disclose the claimed invention, except for the resistivity of the film. The Examiner acknowledges that **Anderson** “does not disclose what material is used for the film (or any of the conductors)” but alleges copper, silver, gold, and aluminum are materials known to be useful for conductive films and ground planes. The Examiner alleges that “[t]he resistivity of these metals is about 30 microohm-cm or less” and takes Official Notice “of the commonness of copper for the formation of conductive films” rendering “the claimed resistivity of 30 microohm-cm or less”.

However, **Anderson** does not teach or suggest, among other things, “a predetermined wiring section being disposed on an insulation board”, as claimed.

Instead, **Anderson** teaches a transmission line 10 characterized “by a plurality of conductors 12 **embedded in** a dielectric 14 having a relative dielectric constant ϵ_r ” (col. 3, lines 22-24)(emphasis added). As shown also in Figure 1, **Anderson** does not teach a plurality of conductors 12 disposed on an insulation board.

The broadest reasonable interpretation of the claims must be consistent with the interpretation that those skilled in the art would reach. *In re Cortright*, 165 F.3d 1353 (Fed. Cir. 1999). Applicant’s specification implicitly defines the meaning of “on” by example, stating in reference to Figure 1 that “the insulation board thus covered is overlaid with the insulating film (polyimide film) 16, and thereafter, leads such as signal leads 12, the control lead 13, the power-source lead (Vdd) 14, and the ground (GND) lead 15 are disposed on the insulating film 16” (page 9, lines 8-11; Fig. 1). Accordingly, **Anderson** does not teach a plurality of conductors 12 disposed on an insulation board, as claimed, under a proper interpretation of “on”.

Moreover, the requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. §103 is not an abstract concept, but must stem from the applied prior art as a whole and have realistically impelled one having ordinary skill in the art to modify a specific reference in a specific manner to arrive at a specifically-claimed invention. *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989). It is respectfully submitted that the Examiner's facially incorrect reasoning fails to discharge the judicial requirement for identifying a basis why one having ordinary skill in the art would have been realistically motivated to modify **Anderson** to arrive at the claimed invention. *In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).

Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." See *In re Fritch*, 972 F.2d 1260 (Fed. Cir. 1992). The Examiner must show reasons why a skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. *In re Rouffet*, supra. The showing must be clear and particular. See, e.g., *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999); *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1352 (Fed. Cir. 1998).

Still further, if a proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the reference are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810 (CCPA 1959). If a proposed modification would render the prior art invention modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984).

In the case at hand, **Anderson** specifically teaches that "[t]he thickness of the dielectric overlayer 14 over the conductors 12 is designated t " (col. 3, lines 28-30) and teaches that "[t]he geometry of the stripline and its dielectric constant determine the mutual capacitance C_m and the mutual inductance L_m . C_m and L_m cannot be made equal to one another without the dielectric thickness t above the conductors." (col. 3, lines 57-61). Thus, to dispose a predetermined wiring section "on an insulation board", as claimed, would render **Anderson** unfit for its intended use and would change the principle of operation of **Anderson** (e.g., balancing C_m and L_m to make K_f substantially 0). Therefore, legally, there is no suggestion or motivation to make the proposed modification. See *In re Gordon*, supra.

Still further, **Anderson** teaches away from the claimed invention. As noted above, **Anderson** teaches that C_m and L_m cannot be made equal to one another without the dielectric thickness t above the conductors,” whereas claim 1 disposes a predetermined wiring section being on an insulation board. **Anderson** must be considered in its entirety, including portions that would lead one skilled in the art away from the claimed invention. See *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983).

For at least the above reasons, **Anderson** does not teach and suggest each and every element of the invention. Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103 rejection of claim 1.

As the Examiner was required, under C.F.R. § 1.104(c), to “cite the best references at his or her command” and since the Examiner was also obligated to reject each claim on all valid grounds available (see MPEP § 707.07(g)), it can only be concluded that the Examiner has already set forth the best rejections possible over claims 1 and 5-9 which were pending at the time of the Final Office Action.

Accordingly, since the 35 U.S.C. § 112 rejections of claims 5-9 have been demonstrated to comply with the requirements of 35 U.S.C. § 112, and no substantive rejection remains, allowance of claims 5-9 is respectfully solicited.

Moreover, as the Examiner has failed to sustain a *prima facie* case as to claim 1, allowance thereof is also requested.

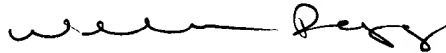
Issuance of a Notice of Allowance is solicited.

The Examiner is respectfully requested to contact the undersigned, if it believed that such contact would further the examination of the present Application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY



William D. Pegg
Registration No. 42,988

600 13th Street, N.W.
Washington, DC 20005-3096
(202) 756-8000 WDP:lnm
Date: December 5, 2001
Facsimile: (202) 756-8087